CONFERENCE REPORT

Hazards XIII: Process Safety—The Future

A three-day symposium organized by the Institution of Chemical Engineers (North Western Branch) and held at UMIST, Manchester, UK, 22–24 April 1997

These seminal events have been running, as John Barton the opening speaker eloquently noted, since 1960 and, as he added, the upcoming millennium should give us pause for serious thought. Process safety requires only a few simple things in order to get it right for a staggeringly large proportion of the time. It requires the basic data of fire and combustion properties of the materials plus the thermochemistry and kinetics of the desired reaction and of any decomposition reactions. This basic data needs to be integrated into a thorough risk analysis methodology where the failure modes and nature of the equipment, people and software are taken into account. Then the corrective preventative measures can be applied. The whole procedure should be covered by a suitable safety management system involving each element of the POCMAR approach. This simple four-step approach (Data - Analysis - Measure - Management Systems) was reflected, not surprisingly, in the structure of the symposium with 47 papers given in single or parallel sessions under the headings of:

- Fire/modelling
- Gas dispersion/explosions
- Chemical properties/decomposition
- Chemical reaction hazards

(21 papers in total)

- Risk analysis/hazard assessment/standards (5 papers)
- Preventative measures (9 papers)
- Management of safety (7 papers)

This gave a total of 42 papers. A further five papers challenged and reviewed current status. The first questioned the complexity of modern plant and asked if this complexity, much of it safety-related, was reaching the point where it was counter-productive, and suggested looking for stronger, simpler, more robust designs.

The second paper reviewed 'where we were', after Trevor Kletz has spend 20 odd years encouraging what is now called Inherent SHE (or what you haven't got can't hurt you), and offered a tool for challenging projects through their life cycle which will be very valuable.

Another challenging paper which provoked much discussion was given on occupational stress by R. Lardner. A lot more research is needed in this area; this paper clearly points the way.

The bit-bashing CFD modellers were out in force with 10 papers in all. However, to my relief at least, validation against experiment was high on the agenda. A very practical application to explosion hazards in CHP and CCGT plants was given by R. C. Santon of the Health and Safety Executive (HSE) and some pure mathematical rigour was introduced by D. M. Webber in 'Dispersion in very buoyant plumes'.

Ignition of activated carbon used in absorption systems at moderate temperatures (*ca.* 120°C) has been a traditional feature of fire hazard testing in most safety laboratories. Their use to reduce VOCs has led to new methods of starting these 'brazier' fires as described by M. Hoyle *et al.* in 'Thermal stability of activated carbon in an absorber bed'.

Anyone who handles nitrocompounds should read J. L. Gustin's paper which comprehensively reviews 'Runaway reaction hazards in processing organic nitrocompounds'.

There were many other excellent papers presented. Due to the 'parallel' nature of the event, I only highlight here those which caught my imagination on the day.

In the 'Risk assessment' section there were two papers from Loughborough University on computer-aided hazard identification which showed great promise. If you are about to be the subject of a three-day HSE safety audit then 'Inspection of health and safety management systems' by I. Travers of the HSE is a good read!

Those concerned with process control in accident and incident prevention by any method (electrical, electronic, computer) will soon be subject to IEC 1508. This replaces the current PES (programmable electronic systems) guidance published by the HSE. IEC 1508 is wider, deeper and more systems-based than PES and an excellent overview of its implications was presented by M. Wilson in 'Emerging international standards for instrument protection systems used in safety applications'.

To vent, or not to vent—that is often the question if one can rely on instrument protective systems instead. A. J. Wilday *et al.* have an interesting paper 'Comparison of pressure relief and instrument protective systems by the means of a case study', which sheds a lot of light on the issue. Safety management systems are currently flavour of the month and a good thing they are too. Such systems ensure comprehensive cover and provide auditability, accountability and traceability. They do not deliver safety. The systems only ensure that whatever level of safety your Data - Analysis - Measure approach provides, it will continue or improve with time. However, all seven papers presented under the 'Preventative measures' heading were of practical value and will reward study.

This was an excellent continuation of the long-running series of 'Hazard Symposia'. It shows that every few years enough new information arises, or old mistakes have been repeated, to more than warrant the time spent attending the conference or at least reading the papers presented.

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For information on purchasing 'Hazards XIII: Process Safety—The Future' (IChemE Symposium Series No. 141) please contact Book Sales, Institution of Chemical Engineers, Davis Building, 165–189 Railway Terrace, Rugby CV21 3HQ, UK (Tel: +44 1788 578214, Fax: +44 1788 560833).